DIV

Applicant: Björn Nilsson Serial No.: 10/618,868 Filed: July 14, 2003

Page : 2 of 37

#### Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

## Listing of Claims:

1. (Currently Amended) A compound of the formula (I):

$$R_2$$
 $R_1$ 
 $R_1$ 
 $R_1$ 
 $R_2$ 

wherein

(i) X and Z represent both CH and Y represents nitrogen, forming a pyridine derivative, or

(ii) X represents C-CF<sub>3</sub>, Z represents CH, and Y represents nitrogen, forming a 4-trifluoromethylpyridine derivative, or

(iii) Y and Z represent both nitrogen and X represents CH, forming a pyrimidine derivative, and wherein  $R_1$  and  $R_2$  are each, independently, selected from a group A consisting of

$$H_3C$$
 $N$ 
 $R_3$ 
 $R_4$ 
 $N$ 
 $R_4$ 

or from a group B, consisting of aryl- $C_1$ - $C_6$ -alkyl, aryl- $C_1$ - $C_6$ -alkoxy, heteroaryl- $C_1$ - $C_6$ -alkoxy, aryloxy- $C_2$ - $C_6$ -alkoxy, heteroaryloxy- $C_2$ - $C_6$ -alkoxy, 1-indanyloxy, 2-indanyloxy, aryloxy, heteroaryloxy, arylthio, heteroarylthio,  $C_5$ - $C_6$ -cycloalkylthio,  $C_5$ - $C_8$ -alkoxy,  $C_5$ - $C_8$ -alkylthio,  $C_5$ - $C_8$ -alkylyloxy,  $C_3$ - $C_6$ -alkenyloxy, fluoro- $C_2$ - $C_4$ -alkoxy,  $C_4$ - $C_8$ -cycloalkyloxy,  $C_3$ - $C_8$ -cycloalkyl-

Applicant: Björn Nilsson Attorney's Docket No.: 13425-056002 / 00410-US -

Serial No.: 10/618,868 Filed: July 14, 2003

Page : 3 of 37

 $C_1$ - $C_4$ -alkoxy, halogen, aryl- $C_1$ - $C_4$ -alkylthio, heteroaryl- $C_1$ - $C_4$ -alkylthio, aryl- $C_1$ - $C_4$ -alkylamino, heteroaryl and aryl; with the proviso that:

- (i) R<sub>1</sub> and R<sub>2</sub> are different and are not both selected from group A or group B at the same time;
- (ii) when both X and Z are CH and Y is N in formula (I), forming a pyridine derivative, and  $R_1$  is 1-piperazinyl or 4 methylpiperazin-1-yl, then  $R_2$ -is other than 2-phenylethyl, benzyloxy, benzylamino, phenylthio, phenoxy, substituted phenoxy,  $C_4$ - $C_8$ -cycloalkyloxy and  $C_3$ - $C_8$ -cycloalkylmethoxy;
- (iii) when X is CH and Z and Y both are nitrogen in formula (I), forming a pyrimidine derivative, and  $R_2$  is 1-piperazinyl, then  $R_1$  is other than phenoxy, phenyl or phenyl substituted by bromo, and  $C_5$ - $C_8$  alkoxy; and when  $R_2$  is 4-methylpiperazin-1-yl or 4-(2-hydroxyethyl)piperazin-1-yl, then  $R_1$  is other than 5-nitro-2-furyl;
- (iv) when X is CH and Z and Y both are nitrogen in formula (I), forming a pyrimidine derivative, and  $R_1$  is 1-piperazinyl, then  $R_2$  is other than  $C_5$ - $C_8$  alkoxy; and where  $R_3$  is H or  $C_{1-4}$ -alkyl, allyl, 2-hydroxyethyl, 2-cyanoethyl, or a nitrogen protecting group, or a prodrug moiety;

 $R_4$  is hydrogen, or  $C_{1-4}$  alkyl;

and wherein any aryl or heteroaryl residue, alone or as part of another group, in  $R_1$  or  $R_2$  may be independently substituted in one or more positions, by  $C_{1-4}$ -alkyl,  $C_{1-4}$ -alkoxy,  $C_{1-4}$ -alkylthio,  $C_{2-4}$ -acyl,  $C_{1-4}$ -alkylsulphonyl, cyano, nitro, hydroxy,  $C_{2-6}$ -alkenyl,  $C_{2-6}$ -alkynyl, fluoromethyl, trifluoromethyl, trifluoromethoxy, halogen,  $-N(R_5)(R_6)$ , aryl, aryloxy, arylthio, aryl- $C_{1-4}$ -alkyl, aryl- $C_{2-4}$ -alkenyl, aryl- $C_{2-4}$ -alkynyl, heteroaryl, heteroaryloxy, heteroarylthio or heteroaryl- $C_{1-4}$ -alkyl, aryl- $C_{1-4}$ -alkoxy, aryloxy- $C_{1-4}$ -alkyl, dimethylamino- $C_{2-4}$ -alkoxy; and wherein any aryl or heteroaryl residue as substituents on aryl or heteroaryl, alone or as part of another group, in  $R_1$  or  $R_2$  in turn may be substituted in one or more postions, independently of

Applicant: Björn Nilsson Serial No.: 10/618,868 DIV

Filed : July 14, 2003 Page : 4 of 37

each other by C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-alkoxy, halogen, trifluoromethyl, cyano, hydroxy or dimethylamino; and

R5 and R6 independently of each other are hydrogen, methyl or ethyl, or together with the nitrogen atom to which they are bound form a pyrrolidine, piperazine, morpholine, thiomorpholine or a piperidine ring;

and or a pharmaceutically acceptable salt, hydrate, geometrical isomer, tautomer, optical isomer, or N-oxide or prodrug form thereof.

- 2. (Withdrawn) The compound according to claim 1, wherein X and Z represent both CH and Y represents nitrogen, forming a pyridine derivative.
- 3. (Withdrawn) The compound according to claim 1, wherein formula (I) represents a 4-trifluoromethylpyridine derivative.
  - 4. (Cancelled)
- 5. (Original) The compound according to claim 1 wherein R<sub>3</sub> is hydrogen and R<sub>1</sub> or R<sub>2</sub> is selected from

6. (Original) The compound according to claim 1 wherein R<sub>1</sub> or R<sub>2</sub> is selected from

Applicant: Björn Nilsson Serial No.: 10/618,868 DIV

Filed : July 14, 2003 Page : 5 of 37

and where R<sub>3</sub> is hydrogen and R<sub>4</sub> is selected from hydrogen, methyl or ethyl.

7. (Original) The compound according to claim 1 wherein R<sub>1</sub> or R<sub>2</sub> is

$$\binom{R_3}{N}$$
  $R_4$ 

and where R<sub>3</sub> is hydrogen and R<sub>4</sub> is selected from hydrogen, methyl or ethyl.

8. (Original) The compound according to claim 1, wherein R<sub>1</sub> or R<sub>2</sub> is selected from

- 9. (Currently Amended) The compound according to claim 1, which is selected from the group consisting of:
- 4-(Benzyloxy)-2-(1-piperazinyl)pyrimidine,
- 4-[(2-Methoxybenzyl)oxy]-2-(1-piperazinyl)pyrimidine, and
- 2-{[3-(Benzyloxy)benzyl]oxy}-4-(1-piperazinyl)pyrimidine,

and or a their pharmacologically acceptable salts salt thereof and solvates.

10. (Original) A pharmaceutical composition comprising a compound according to claim 1 as an active ingredient, together with a pharmaceutically acceptable carrier.

Applicant : Björn Nilsson Attorney's Docket No.: 13425-056002 / 00410-US - Serial No. : 10/618,868 DIV

Serial No.: 10/618,868 Filed: July 14, 2003 Page: 6 of 37

11. (Cancelled).

- 12. (Cancelled)
- 13. (Currently Amended) <u>A The</u> method <u>for the treatment of according to claim-11</u>, wherein the medical condition is an eating disorder, <u>comprising administering to a subject in</u> need thereof a therapeutically effective amount of a compound according to claim 1.
- 14. (Currently Amended) A The method for the treatment of according to claim 11, wherein the medical condition is obesity, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.
- 15. (Currently Amended) A The method for the treatment of according to claim 11, wherein the medical condition is a memory disorder, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.
- 16. (Currently Amended) A The method for the treatment of according to claim 11, wherein the medical condition is a mood disorder, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.
- 17. (Currently Amended) <u>A The</u> method <u>for the treatment of according to claim 11</u>, wherein the medical condition is an anxiety disorder, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.
- 18. (Currently Amended) <u>A The</u> method <u>for the treatment of according to claim 11</u>, wherein the medical condition is selected from sexual dysfunctions, epilepsy and <u>or</u> urinary

Applicant: Björn Nilsson Serial No.: 10/618,868

: July 14, 2003 Filed

: 7 of 37 Page

disorders, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.

- 19. (Currently Amended) A The method for the treatment of according to claim 11, wherein the medical condition is pain, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.
- 20. (Currently Amended) A The method for the treatment of according to claim 11, wherein the medical condition is substance abuse, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.
- 21. (Currently Amended) A The method for the treatment of according to claim 11, wherein the medical condition is schizophrenia, comprising administering to a subject in need thereof a therapeutically effective amount of a compound according to claim 1.
- 22. (Currently Amended) A method of making a compound of claim 1, the method comprising:
  - (a) taking converting a compound of the following formula:

wherein

(i) X and Z represent both CH and Y represents nitrogen, forming a pyridine derivative, or

(ii) X represents C-CF<sub>3</sub>, Z represents CH, and Y represents nitrogen, forming a 4trifluoromethylpyridine derivative, or

(iii) Y and Z represent both nitrogen and X represents CH, forming a pyrimidine derivative, and wherein

DIV

Applicant: Björn Nilsson Serial No.: 10/618,868 Filed: July 14, 2003

Page : 8 of 37

each Hal is independently a halogen;

to a compound of formula (IX):

wherein  $R_2$  is as defined in claim 1 and with the proviso that  $R_2$  is not any of the following groups:

$$R_3$$
 $R_4$ 
 $R_3$ 
 $R_4$ 
 $R_4$ 

(b) contacting the compound of formula (IX) with a compound selected from the group consisting of:

$$R_3$$
  $R_3$   $R_3$   $R_4$   $R_5$   $R_4$   $R_4$   $R_5$   $R_6$   $R_7$   $R_8$   $R_8$   $R_8$   $R_8$   $R_9$   $R_9$ 

<u>or</u>

DIV

Applicant: Björn Nilsson Serial No.: 10/618,868

: July 14, 2003 Filed

Page : 9 of 37

# (a') converting a compound of the following formula:

# wherein Y and Z represent both nitrogen and X represents CH, forming a pyrimidine derivative, and wherein each Hal is independently a halogen;

## to a compound of formula (XIII):

# wherein Am is an amine residue selected from the group consisting of:

Applicant : Björn Nilsson Attorney's Docket No.: 13425-056002 / 00410-US - Serial No. : 10/618,868 DIV

Serial No. : 10/618,868 Filed : July 14, 2003 Page : 10 of 37

### (b') converting the compound of formula (XIII) to a compound of the following formula:

wherein  $R_1$  is as defined in claim 1 and with the proviso that  $R_1$  is not any of the following groups:

with and reacting the compound with one or more chemical reagents in one or more steps to produce thereby producing a compound of claim 1.

- 23. (Cancelled)
- 24. (Cancelled)
- 25. (Original) The compound according to claim 1, wherein R<sub>3</sub> is an acyl- or alkoxycarbonyl group forming a cleavable amide or carbamate linkage.
- 26. (New) The method of claim 15, wherein the memory disorder is Alzheimer's disease.
  - 27. (New) The method of claim 16, wherein the mood disorder is depression.